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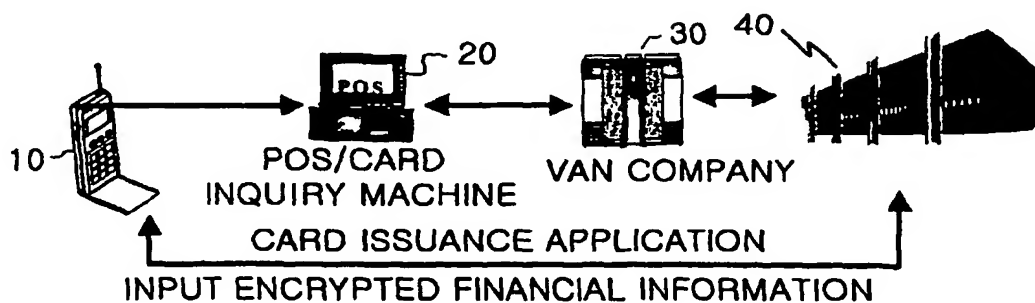
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(54) Title: METHOD AND SYSTEM FOR SETTLING FINANCIAL TRANSACTION WITH MOBILE COMMUNICATIONS
PORTABLE TERMINAL CONTAINING FINANCIAL INFORMATION



(57) Abstract: A method and system for settling financial transactions with a mobile communications terminal (10) containing financial information is disclosed. Financial information such as a card number and a valid date is encrypted by using a customer's inherent electronic wallet management number such as a secret number at the time of application of a card issuance, and then the encrypted financial information is input to a mobile communications terminal (10) designated by a customer, directly or via a communications network. When a customer wishes to settle financial transactions through the mobile communications terminal (10), he or she inputs his or her electronic wallet management number to optically transmit the encrypted financial information and electronic wallet management number to a POS terminal (20) or card inquiry machine in an affiliated store. The POS terminal (20) or card inquiry machine which has received the optically transmitted financial information and electronic wallet management number decodes the encrypted financial information by using the received electronic wallet management number. Thus, unless customer's electronic wallet management number such as a secret number is exposed illegally, no one who knows an encryption algorithm can use the customer's financial information illegally.

WO 02/080122 A1



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

**METHOD AND SYSTEM FOR SETTLING FINANCIAL
TRANSACTION WITH MOBILE COMMUNICATIONS PORTABLE
TERMINAL CONTAINING FINANCIAL INFORMATION**

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DESCRIPTION

Technical Field

The present invention relates to an optical settlement system using a mobile communications portable terminal to which an optical transceiver is attached, and more particularly, to a method and system for settling various financial transactions through a mobile communications portable terminal in which an electronic wallet management number called a secret number is introduced to prevent financial settlement information contained in the mobile communications portable terminal from being illegally copied and used.

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Background Art

Recently, cards which are more convenient to use them and handier to carry them than cash are widely being used for settling financial transaction. The cards are classified into a credit card, a cash card, a direct payment card, an advance payment card, and so on according to a settlement method. Also, the cards are classified into a traffic card, a department store card, a gas filling card, a park entrance card and so on according to a use method. A credit card and an advance payment card are used as a traffic card, respectively. Cards which are frequently used are made of plastic, in which a magnetic recording surface exists in the form of a magnetic strip which contains card information such as a card identification number and a valid date.

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The plastic card having a magnetic recording surface in the form of a magnetic strip may be replaced by a mobile communications portable terminal to

which an optical transceiver such as a portable phone or a personal digital assistance (PDA) is attached, in order to avoid a loss or an illegal use. For example, new settling systems which can replace a plastic magnetic card have been proposed in Korean Patent Application No. 2000-13426 entitled
5 "Commercial system using mobile phone" and Korean Patent Application No. 2000-31640 (Patent Laid-open Publication No. 2001-112562 on December 20, 2001) entitled "Settling method using mobile phone." According to the new settling systems, an optical transceiver is attached to a portable mobile phone which is being widely used, and an optical receiver is attached to a credit inquiry
10 machine. Here, card information is contained in the mobile phone to which the optical transceiver is attached. Thus, the card information can be optically transmitted and received between the mobile phone and the credit inquiry machine, without using a credit card.

However, in the case that a mobile communications terminal containing
15 card information is used as a substitute of a magnetic card such as a credit card, an advance payment card, and a bank settlement card, if the card information is contained in the mobile communications terminal without any modification, it may be copied and used illegally. In particular, in the case that card information is stored in a memory device provided in a mobile communications terminal, one
20 who understands the technology of the mobile communications terminal may copy the card information stored in the memory device by use of professional equipment. Thus, card issuance authorities such as card companies and banks endeavor to avoid card information from being stored in a mobile communications terminal in the form of the same card information as that stored in a magnetic card.
25 However, in the case of banking transactions which are performed by many and unspecified persons, an encryption system using a public key encryption (PKI) consumes a large amount of calculation time, which causes customers to feel more inconveniences than the current system. Also, in the case that a symmetric key is

used, the same symmetric key is input to a number of POS (Point Of Sales) terminals, which makes it difficult to protect keys.

Disclosure of the Invention

5 To solve the above problems, it is an object of the present invention to provide a method and system for settling financial transactions with a mobile communications terminal containing financial information, in which an electronic wallet management number (such as a secret number) is used as a key of an encryption algorithm, to encrypt customer's financial information and store the
10 encrypted customer's financial information in a mobile communications terminal to thereby enhance a security of the financial transactions.

 To accomplish the above object of the present invention, there is provided a method for settling financial transactions with a mobile communications terminal containing financial information, in which the mobile communications terminal to
15 which an optical transceiver is attached is used as a substitute of a credit card, the financial transactions settlement method comprising the steps of: (a) inputting an electronic wallet management number such as a secret number at the time of application of a card issuance; (b) encrypting financial information including a customer's inherent card number by using the input customer's inherent electronic
20 wallet management number such as a secret number; (c) storing the encrypted financial information in the mobile communications terminal; (d) coinciding a settlement secret number with the electronic wallet management number such as a secret number input during the card issuance application in the mobile communications terminal; (e) inputting the electronic wallet management number
25 such as a secret number into the mobile communications terminal during the financial transactions to thus select a settlement mode; (f) transmitting the encrypted financial information stored in the mobile communications terminal and the electronic wallet management number such as a secret number at the

- settlement mode; (g) receiving the financial information and the electronic wallet management number such as a secret number which are transmitted from the mobile communications terminal, and decoding the financial information by use of the received electronic wallet management number such as a secret number; and
- 5 (h) settling the financial transactions with the decoded financial information.

There is also provided a system for settling financial transactions with a mobile communications terminal containing financial information, in which the mobile communications terminal to which an optical transceiver is attached is used as a substitute of a credit card, the financial transactions settlement system

10 comprising: a banking authority for encrypting customer's financial information by using a customer's inherent electronic wallet management number such as a secret number of a customer who requests for issuance of a credit card, storing the encrypted financial information in the mobile communications terminal designated by the mobile communications terminal, and approving the settlement requested

15 financial information; a mobile communications terminal for storing financial information input from the banking authority, and optically transmitting the electronic wallet management number such as a secret number together with the financial information containing the electronic wallet management number such as a secret number input at a settlement mode; a point of sale (POS) terminal/card

20 inquiry machine for receiving the optically transmitted financial information and the electronic wallet management number such as a secret number, decoding the financial information by using the received electronic wallet management number such as a secret number, and requesting for a settlement of customer's transactions by using the decoded financial information; and a VAN company for receiving the

25 settlement request of the POS terminal/card inquiry machine, transferring the settlement request to the banking authority, and notifying an approval result of the banking authority to a requested POS terminal/card inquiry machine.

Brief Description of the Drawings

The above object and other advantages of the present invention will become more apparent by describing the preferred embodiments thereof in more detail with reference to the accompanying drawings in which:

5 FIG. 1 shows a configuration of a financial transactions settlement system to which the present invention is applied;

 FIG. 2 is a flowchart view for explaining a method for storing financial information in a mobile communications terminal in the FIG. 1 system; and

 FIG. 3 is a flowchart view for explaining a financial transactions
10 settlement process using the mobile communications terminal containing the financial information.

Best Mode for Carrying Out the Invention

 A preferred embodiment of the present invention will be described in
15 detail with reference to the accompanying drawings.

 A financial transactions settlement system shown in FIG. 1 includes a portable mobile communications terminal 10 to which an optical transceiver such as a portable phone or a PDA which is possessed by a card issuance applicant is attached, and a banking authority 40 such as a card company or a bank for
20 encrypting financial information including a card number and inputting the encrypted financial information to the mobile communications terminal 10, to then issue a card. A POS terminal or a card inquiry machine 20 to which an optical transceiver is attached, receives optically transmitted financial information to then perform a financial transaction settlement process. The financial transactions
25 settlement system of FIG. 1 also includes a VAN company 30 which receives an approval request from the POS terminal or card inquiry machine 20 and then transfers the received approval request to a corresponding banking authority 40, and then transfers the approval result to the POS terminal or card inquiry machine 20

which has sent the approval request. The operation of the financial transactions settlement system of FIG. 1 for settling financial transactions with the mobile communications terminal 10 containing financial information will be described below with respect to FIGs. 2 and 3.

5 First, a procedure of issuing a card to the mobile communications terminal 10 with an increased security as a substitute of a magnetic card, will be described below.

A customer makes up an application for using a portable mobile communications terminal 10 owned by him or her as a card, and applies an
10 issuance of a settlement card for use in the mobile communications terminal 10 to a corresponding banking authority 40 such as a card company or bank which can issue cards for customers. Here, the customer additionally writes in a secret number for a settlement mode of the terminal (step 201). Here, the settlement mode secret number is an electronic wallet management number in which personal
15 financial information is collected. The electronic wallet management number such as a secret number is typically four digits, but can be increased more than four digits according to needs of the banking authority 40. The banking authority 40 examines the mobile communications terminal card issuance application, and then if the application is approved, the electronic wallet management number such
20 as a secret number applied by the customer is used as a key of an encryption algorithm, to thus encrypt financial information such as a card number and a valid date (step 202). As an encryption method, an algorithm of a symmetric key encryption technique such as DES (Data Encryption Standard) and an electronic wallet management number such as a secret number requested by the customer, are
25 used as a key, and declarative sentence information such as a card number and a valid date to be recorded on a recording surface of the magnetic card and the inherent encrypted information of the banking authority are encrypted once more. That is, a symmetric key patterned algorithm is used, which cannot be solved

unless his or her secret code is learnt by heart. Thus, even if financial information to be contained in the mobile communications terminal 10 is exposed, the financial information cannot be used unless the electronic wallet management number such as a secret number used as a key is learnt by heart. For this reason, since the leaked encryption algorithm cannot be used without knowing the electronic wallet management number such as a secret number of the owner, the mobile communications terminal card according to the present invention increases its security in comparison with the magnetic card. In step 202, the banking authority 40 can encrypts only part of the financial information or additionally encrypts other information such as a telephone number. For example, in the case that a PDA having no telephone number is used as a card substitution mobile communications terminal 10, the inherent number of the PDA is additionally encrypted. In the case that other information such as a telephone number or a device inherent number is additionally encrypted, the encrypted other information can be used for authenticating a true person during settlement. The banking authority 40 inputs the encrypted financial information to the mobile communications terminal 10 directly by cable, or wirelessly using a wireless communications network (step 203). That is, in the case that a customer visits the banking authority 40 directly with the mobile communications terminal 10 held, the banking authority 40 inputs the encrypted financial information to the mobile communications terminal 10 via an interface (not shown) provided in the lower end of the mobile communications terminal 10 for the sake of securities. The mobile communications terminal 10 stores the input financial information in an internal memory or an external memory such as a detachable IC chip, so that the stored financial information can be used for settlement of later card transactions. According to selection of customers, financial information can be input to the mobile communications terminal 10 using a wireless network. When financial information is completely input to the mobile communications terminal 10 after

approval of credit, the customer coincides the electronic wallet management number such as a secret number of the settlement mode with the electronic wallet management number such as a secret number input during application of the card (step 204). Here, if the electronic wallet management number such as a secret
5 number is encrypted in the form of an irreversible function, and stored in the mobile communications terminal 10, its security can be further increased. Through the above-described procedure, the mobile communications terminal 10 can be used as a substitute of a plastic card having a magnetic recording surface.

A procedure of performing a settlement process with the mobile
10 communications terminal 10 containing the financial information issued through the FIG. 2 procedure, will be described below.

In the case that a commodity purchase payment or a traffic fare payment is performed in a general store or an electronic commerce, a customer manipulates a keypad on the mobile communications terminal 10 containing the financial
15 information and inputs the electronic wallet management number such as a secret number, to thereby select a financial settlement mode (step 301). The settlement mode electronic wallet management number such as a secret number corresponds to the electronic wallet management number such as a secret number applied at the time of applying the card issuance. At a financial settlement mode, the mobile
20 communications terminal 10 encrypts the input electronic wallet management number such as a secret number into an irreversible function, and ascertains whether the encrypted value equals the encrypted value of the electronic wallet management number such as a secret number which has been encrypted into an irreversible function and then stored (step 302). If both management numbers
25 such as secret numbers equal each other, the mobile communications terminal 10 performs a settlement mode normally. If both the management numbers do not equal at step 302, a management number is re-input more than a predetermined number of times to ascertain the management number. If the management

number does not equal the stored management number more than a predetermined number of times (step 304), the settlement mode is locked to prevent the electronic wallet management number such as a secret number from being exposed (step 305). At a normal settlement mode, the customer selects the kind of a card to be used (step 303). Then, the customer presses a predetermined transmit button on a keypad of the mobile communications terminal 10, so that the financial information and the electronic wallet management number such as a secret number corresponding to the kind of the selected card among the financial information stored in the mobile communications terminal 10 can be transmitted to a POS terminal or a card inquiry machine 20 (step 306). The mobile communications terminal 10 transmits the information corresponding to the card selected by the user among various kinds of the stored card information such as credit card information, direct payment information and advance payment card information, in the form of an infrared (Ir) ray, together with the electronic wallet management number such as a secret number. Here, although the infrared (Ir) ray has been used as a communications means, it will be apparent to one skilled in the art that the present invention is not limited thereto. An encryption algorithm is used for communications between the mobile communications terminal 10 and the POS terminal or card inquiry machine 20, to thus increase a security. An optical transceiver is attached to a portable terminal such as a portable phone, a PDA, a notebook computer, in the case of the present invention. Thus, the present invention uses the optical transceiver attached to the mobile communications terminal 10, to perform an optical transmission and reception. The optical transceiver is connected internally or externally to the POS terminal or card inquiry machine 20 in a card affiliated store, to thereby receive the financial information and the electronic wallet management number such as a secret number which is optically transmitted from the customer's mobile communications terminal 10.

It is usually a short distance of about one meter between the mobile communications terminal 10 and the optical transceiver in the POS terminal or card inquiry machine 20. Also, since light used in the optical transceiver has a linearity, it is difficult to copy the financial information and the secret number illegally. However, the owner of a POS terminal or card inquiry machine 20 may copy the financial information and the secret number illegally, through a current wired communications network, which will not be discussed herein since an illegal copy through the wired communications network is distinct from the illegal copy in the optical communications used in the present invention. The POS terminal or card inquiry machine 20 performs only a decoding algorithm without keeping a separate encryption key, and decodes the encrypted financial information once more by using the received electronic wallet management number such as a secret number (step 307). The POS terminal or card inquiry machine 20 transmits the financial information decoded and restored into the original state to the card company 40 via the VAN company 30 as in an existing financial transactions system, so that a computerized network in the card company 40 can determine whether an approval of the financial transaction can be made (step 308). If the received electronic wallet management number such as a secret number is different from the stored electronic wallet management number such as a secret number, the financial information decoded by using the different electronic wallet management number such as a secret number is different from the original financial information. Thus, an approval is not made. Meanwhile, in the case that the other information of the customer's telephone number or the device inherent number which have been allowed by the banking authority 40 is additionally encrypted by using the electronic wallet management number such as a secret number, the mobile communications terminal 10 transmits the encrypted electronic wallet management number such as a secret number together with the encrypted customer's telephone number or the device inherent number, during transmission of the encrypted

- 11 -

information. In this case, the POS terminal or card inquiry machine 20 compares the telephone number in the decoded information with the received telephone number, to perform an authentication of a true person. Of course, a true person authentication may be done by using the customer's other information other than the telephone number. Thus, the POS terminal or card inquiry machine 20 can obtain a quick approval without passing through a database in the banking authority 40 at a petty settlement mode or traffic mode, which provides much conveniences.

It takes much time for even an expert to catch an electronic wallet management number such as a secret number of the mobile communications terminal 10 mechanically. However, since the possessor of the mobile communications terminal 10 may declare a loss of the mobile communications terminal, it is not possible to catch the electronic wallet management number such as a secret number without having a prior agreement from the possessor of the mobile communications terminal 10, other than an application of an after-service. Also, even when an after-service is applied, after the electronic wallet management number such as a secret number has been altered illegally, the customer's financial information encrypted more than once cannot be solved. Further, in the case that the mobile communications terminal 10 is handed over to a sales person at a normal settlement mode, the financial settlement is done only once. After the financial settlement has been done once, the mobile communications terminal 10 may be automatically changed into a telephone use mode. For re-use of the mobile communications terminal 10, the mobile communications terminal 10 may request for the electronic wallet management number such as a secret number to be inputted again. In this case, the customer does not need to go to a counter in order to secure a transaction at a restaurant or gas station, which provides much conveniences. As a result, a credit settlement through the mobile communications terminal 10 can be done comfortably. Also,

in the case that a customer wishes to know his or her financial information at a settlement mode of the mobile communications terminal 10, a card information confirmation menu is selected and then a decoding program in the mobile communications terminal 10 is executed, so that information such as a card
5 number and a valid date can be displayed on a screen.

As described above, the method and system for settling financial transactions with a mobile communications terminal containing financial information according to the present invention encrypts financial information with a respective different symmetric key for each customer and then inputs the
10 encrypted financial information in the mobile communications terminal to which an optical transceiver is attached, for a substitute use of an existing plastic card having a magnetic recording surface. Accordingly, all financial transactions can be settled with a mobile communications terminal without holding a wallet separately. Further, the present invention provides an electronic wallet which can
15 store various cards and financial information simultaneously. Also, the card company can increase conveniences for customers, enhance a security of settlement of financial transactions and thus maximize profit, without any alteration of the existing system. Also, a cost for issuance of cards which should be continuously issued regularly and at interval can be reduced. Since financial
20 information can be transmitted only once during settlement, and then a mobile communications terminal is changed into a telephone use mode, a secure financial transaction can be done even in the case that the mobile communications terminal is handed over to a sales person at a gas station or restaurant. In addition, in the case that a customer should know his or her card number and valid date of which
25 the input is requested for on the browser as in an existing Internet settlement, such card information can be displayed on a screen of a mobile communications terminal at a card information confirmation menu, which provides an effect that can be applicable in the same manner as that of the existing card settlement.

Industrial Applicability

As described above, the method and system for settling financial transactions with a mobile communications terminal containing financial information according to the present invention can be applied in a financial settlement card field where all forms of cards such as credit cards, direct payment cards, cash cards, department store cards, electronic money cards, a merchandise bond or coupon can be used as settlement means, and in an identification (ID) card field where all forms of cards such as health insurance cards and entrance cards containing personal ID information, bonus cards which can receive various additional services through ID confirmation, and family cards can be used as personal identification means.

CLAIMS

1. A method for settling financial transactions with a mobile communications terminal containing financial information, in which the mobile communications terminal to which an optical transceiver is attached is used as a substitute of a credit card, the financial transactions settlement method comprising the steps of:

(a) inputting an electronic wallet management number such as a secret number at the time of application of a card issuance;

(b) encrypting financial information including a customer's inherent card number by using the input customer's inherent electronic wallet management number such as a secret number;

(c) storing the encrypted financial information in the mobile communications terminal;

(d) coinciding a settlement secret number with the electronic wallet management number such as a secret number input during the card issuance application in the mobile communications terminal;

(e) inputting the electronic wallet management number such as a secret number into the mobile communications terminal during the financial transactions to thus select a settlement mode;

(f) transmitting the encrypted financial information stored in the mobile communications terminal and the electronic wallet management number such as a secret number at the settlement mode;

(g) receiving the financial information and the electronic wallet management number such as a secret number which are transmitted from the mobile communications terminal, and decoding the financial information by use of the received electronic wallet management number such as a secret number; and

(h) settling the financial transactions with the decoded financial information.

2. The method of claim 1, wherein in said step (b) an algorithm of a symmetric key encryption technique is used, and the financial information is encrypted by using a customer's electronic wallet management number such as a secret number as a key.

5 3. The method of claim 1, wherein in said step (b) only part of the financial information is encrypted.

4. The method of claim 1, wherein in said step (b) the customer's other information including a telephone number assigned to the mobile communications terminal is additionally encrypted.

10 5. The method of claim 1, wherein in said step (c) the financial information is directly input and then stored in the mobile communications terminal.

6. The method of claim 1, wherein in said step (c) the financial information is input and then stored via a communications network in the mobile
15 communications terminal.

7. The method of claim 1, wherein in said step (d) the electronic wallet management number such as a secret number is encrypted in an irreversible function and then stored as a settlement secret number.

8. The method of claim 1, further comprising the step (i) of executing a
20 decoding program and then displaying the financial information including a card number and a valid date on the screen of the mobile communications terminal, if a financial information confirmation menu of the mobile communications terminal is selected at a settlement mode in said step (e).

9. The method of claim 7, wherein said step (e) comprises the sub-steps
25 of:

(e1) ascertaining whether the input electronic wallet management number such as a secret number equals the pre-stored settlement secret number;

(e2) requesting for re-input of the electronic wallet management number

such as a secret number for a predetermined number of times if both numbers do not equal in the result of confirmation, and then selecting the kind of the card if both numbers equal in the result of re-confirmation; and

(e3) if both numbers do not equal in the result of re-confirmation for the
5 predetermined number of times, locking a settlement mode and preventing the electronic wallet management number such as a secret number from being exposed illegally.

10. The method of claim 9, wherein said step (e1) comprises the sub-steps of encrypting the input electronic wallet management number such as a
10 secret number as an irreversible function, and then confirming whether the encrypted value equals the encryption value of the electronic wallet management number such as a secret number encrypted as the irreversible function and stored as a settlement secret number.

11. The method of claim 10, wherein in said step (f) the financial
15 information including the card number corresponding to the kind of the selected card is transmitted together with the electronic wallet management number such as a secret number.

12. The method of claim 11, wherein in said step (f) the financial
20 information and the electronic wallet management number such as a secret number is transmitted in the form of an optical signal of the infrared (Ir) ray.

13. The method of claim 4, wherein in said step (f) the customer's other
information including the encrypted telephone number is transmitted together with the customer's information including the financial information, the electronic
wallet management number such as a secret number and the telephone number
25 assigned to the mobile communications terminal, and in said step (g) the financial information and the customer's other information are decoded by using the received electronic wallet management number such as a secret number.

14. The method of claim 13, wherein in said step (h) the decoded

customer's other information is compared with the received information for a true person authentication.

15. The method of claim 14, wherein in said step (h) the decoded telephone number is compared with the received telephone number for a true person authentication.

16. A system for settling financial transactions with a mobile communications terminal containing financial information, in which the mobile communications terminal to which an optical transceiver is attached is used as a substitute of a credit card, the financial transactions settlement system comprising:

10 a banking authority for encrypting customer's financial information by using a customer's inherent electronic wallet management number such as a secret number of a customer who requests for issuance of a credit card, storing the encrypted financial information in the mobile communications terminal designated by the mobile communications terminal, and approving the settlement requested financial information;

15 a mobile communications terminal for storing financial information input from the banking authority, and optically transmitting the electronic wallet management number such as a secret number together with the financial information containing the electronic wallet management number such as a secret number input at a settlement mode;

20 a point of sale (POS) terminal/card inquiry machine for receiving the optically transmitted financial information and the electronic wallet management number such as a secret number, decoding the financial information by using the received electronic wallet management number such as a secret number, and requesting for a settlement of customer's transactions by using the decoded financial information; and

a VAN company for receiving the settlement request of the POS terminal/card inquiry machine, transferring the settlement request to the banking

authority, and notifying an approval result of the banking authority to a requested POS terminal/card inquiry machine.

17. The settlement system of claim 16, wherein said mobile communications terminal stores the encrypted financial information in an internal
5 memory or a detachable IC chip type external memory.

18. The settlement system of claim 16, wherein said mobile communications terminal additionally encrypts a telephone number if said mobile communications terminal is a portable phone terminal assigned with the telephone number, and additionally encrypts a device inherent number if said mobile
10 communications terminal is a PDA without having a telephone number, and transmits the encrypted telephone number and device inherent number together with the financial information, the electronic wallet management number such as a secret number and the currently available telephone number or device inherent number.

15 19. The settlement system of claim 18, wherein said POS terminal or card inquiry machine decodes the financial information and the additionally encrypted telephone number or device inherent number, by using the received electronic wallet management number such as a secret number, and compares the decoded telephone number or device inherent number with the received telephone
20 number or device inherent number for a true person authentication.

1/2

FIG. 1

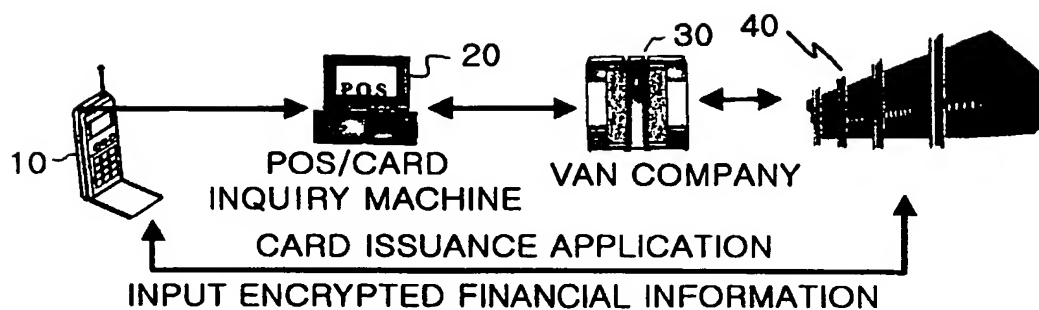
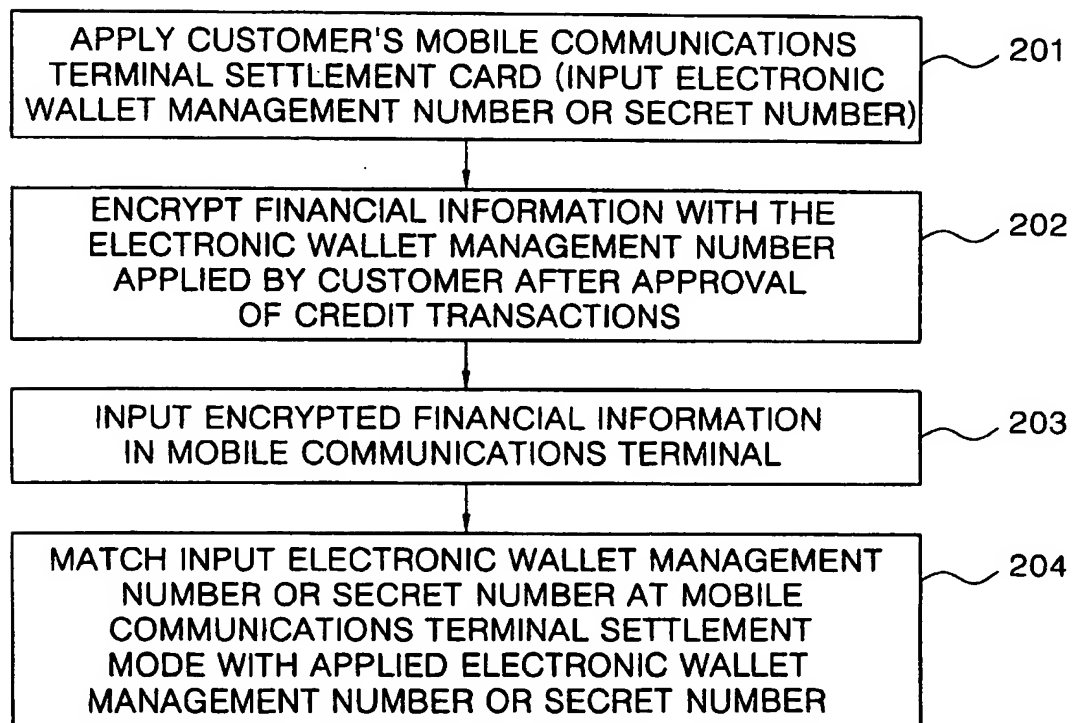
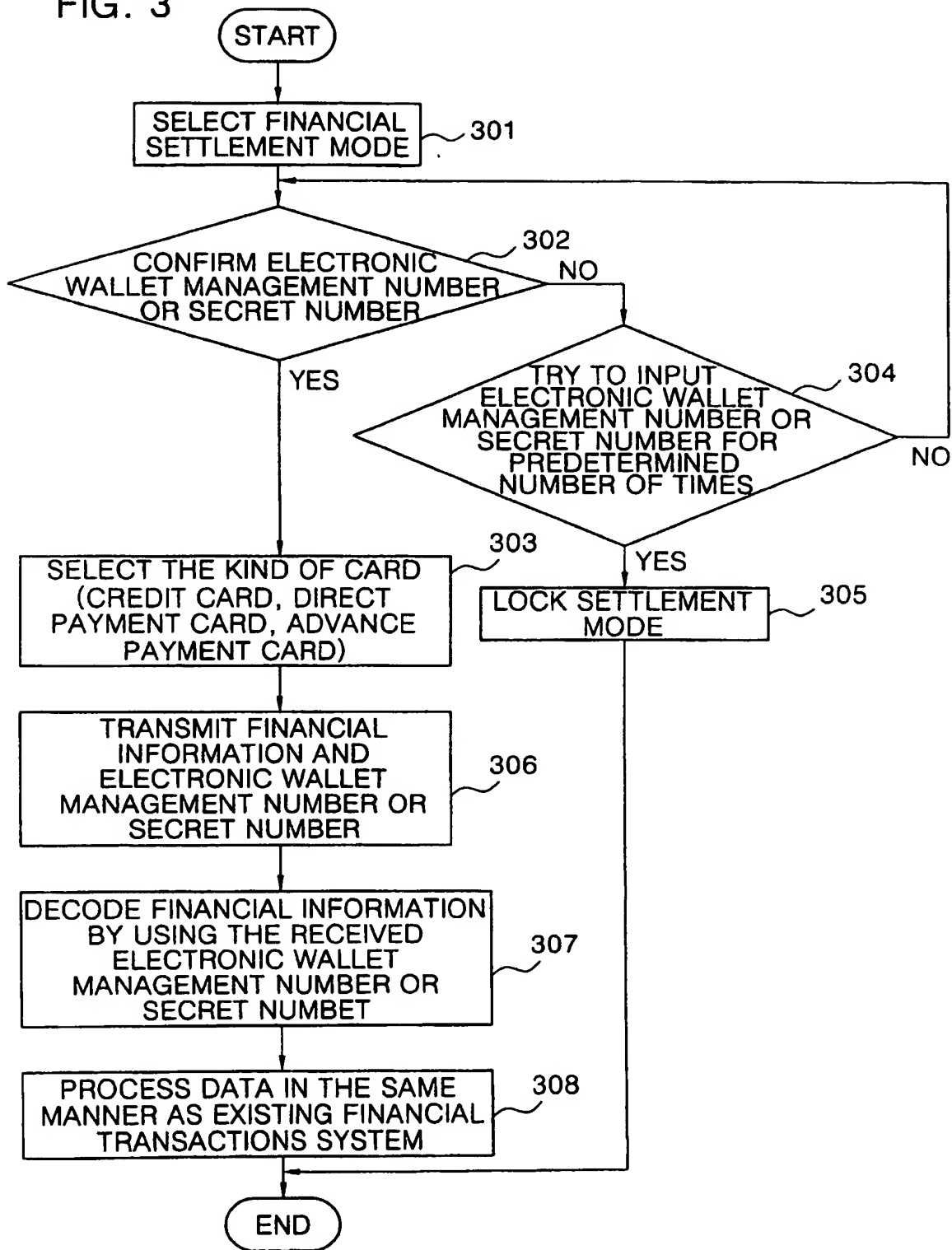


FIG. 2



2/2

FIG. 3



INTERNATIONAL SEARCH REPORT

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CLASSIFICATION OF SUBJECT MATTER

IPC⁷: G07F 19/00, G07F 7/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, EPODOC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00/31699 A1 (Easy Charge Cellular (PTY) Limited) 2 June 2000 (02.06.00) <i>page 6-9, fig. 1.</i>	1,3,6,8
Y	<i>page 6-9, fig. 1.</i>	2,4,7,9-19
A	<i>page 6-9, fig. 1.</i>	5
Y	WO 00/28493 A (Kent Ridge Digital Labs) 18 May 2000 (18.05.00) <i>abstract.</i>	2
Y	EP 1017029 A2 (Fujitsu Limited) 5 July 2000 (05.07.00) [0045], [0078], [0088], [0089], [0090], [0146], [0166].	4,9-19
Y	JP 2000 224162 A (Hitachi Ltd) 11 August 2000 (11.08.00) <i>abstract.</i>	7
A	WO 98/34203 A1 (Qualcomm Incorporated) 6 August 1998 (06.08.98) <i>page 3,4, fig. 1,8.</i>	1-19

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

19 June 2002 (19.06.2002)

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR 02/00495-0

Patent document cited in search report			Publication date	Patent family member(s)			Publication date
EP	A2	1017029	05-07-2000	JP	A2	00184085	30-06-2000
JP	A2	00224162	11-08-2000			none	
WO	A	028493				none	
WO	A	031699				none	
WO	A1	9834203	06-08-1998	AU	A1	59638/98	25-08-1998